

IN THE CLAIMS:

Please cancel claims 11-35, without prejudice, and amend the claims as follows:

1. (Currently Amended) ~~An apparatus~~ A cartridge for dispensing a chemical reagent into a plating solution, comprising:

~~a tank for containing the plating solution;~~

a vessel in ~~fluid communication with the tank~~, wherein the vessel has an inlet and an outlet;

at least one horizontal shelf contained inside the vessel, wherein the at least one horizontal shelf is positioned to hold the chemical reagent and ~~exposes~~ expose the chemical reagent to the plating solution flowing from the inlet to the outlet; and

a porous material disposed in a fluid path defined in the cartridge.

2. (Currently Amended) The ~~apparatus~~ cartridge of claim 1, wherein at least one horizontal shelf is impermeable to the plating solution.

3. (Currently Amended) The ~~apparatus~~ cartridge of claim 1, wherein the at least one shelf comprises about 1 to about 50 shelves ~~plating solution is an acidic, electrochemical anolyte and includes copper ions.~~

4. (Currently Amended) The ~~apparatus~~ cartridge of claim 1-3, wherein a headspace has a height disposed above the at least one horizontal shelf.

5. (Currently Amended) The ~~apparatus~~ cartridge of claim 4, wherein the headspace is in a range from about 5 cm to about 30 cm.

6. (Currently Amended) The ~~apparatus~~ cartridge of claim 5, wherein the plating solution ~~electrochemical anolyte~~ flows from the inlet to the outlet via the headspace.

7. (Currently Amended) The apparatus cartridge of claim 6, wherein the plating solution electrochemical anolyte is replenished by the chemical reagent.

8. (Currently Amended) The apparatus cartridge of claim 7, wherein the chemical reagent comprises a copper source compound selected from the group consisting of copper hydroxide, copper carbonate, copper oxide, copper sulfate, copper phosphate, derivatives thereof or combinations thereof.

9. (Currently Amended) The apparatus cartridge of claim 1, wherein the at least one horizontal shelf includes a flat shelf, a longitudinally grooved shelf, a tubular shelf or combinations thereof.

10. (Currently Amended) The apparatus cartridge of claim 9, wherein the porous material is vessel ~~comprises at least one porous material~~ selected from the group consisting of a membrane, a filter, a frit, a mesh or combinations thereof.

11. – 35. (Canceled)

36. (Currently Amended) ~~An~~ A cartridge apparatus for dispensing a chemical reagent into a plating solution, comprising:

~~a tank for containing the plating solution;~~

~~a vessel in fluid communication with the tank, wherein the vessel has an inlet and an outlet;~~

~~at least one impermeable shelf contained inside the vessel, wherein the at least one impermeable shelf is positioned to hold the chemical reagent and expose the chemical reagent to the plating solution flowing from the inlet to the outlet; and~~

a porous material disposed in a fluid path defined in the cartridge.

37. (New) The cartridge of claim 36, wherein the shelf is made from a material selected from the group consisting of plastics, stainless steel, aluminum, titanium, nickel-coated steel.
38. (New) The cartridge of claim 36, wherein the at least one shelf comprises about 1 to about 50 shelves.
39. (New) The cartridge of claim 36, wherein a headspace has a height disposed above the at least one shelf.
40. (New) The cartridge of claim 39, wherein the headspace is in a range from about 5 cm to about 30 cm.
41. (New) The cartridge of claim 40, wherein the plating solution flows from the inlet to the outlet via the headspace.
42. (New) The cartridge of claim 41, wherein the plating solution is replenished by the chemical reagent.
43. (New) The cartridge of claim 42, wherein the chemical reagent comprises a copper source compound selected from the group consisting of copper hydroxide, copper carbonate, copper oxide, copper sulfate, copper phosphate, derivatives thereof or combinations thereof.
44. (New) The cartridge of claim 36, wherein the at least one shelf includes a flat shelf, a longitudinally grooved shelf, a tubular shelf or combinations thereof.
45. (New) The cartridge of claim 44, wherein the porous material is selected from the group consisting of a membrane, a filter, a frit, a mesh or combinations thereof.